## AMENDMENTS TO THE CLAIMS

1. – 8. (Cancelled)

9. (Amended)    The method of Claim 8 21 wherein the selected number of the first ac voltage and the second ac voltage measurements used to generate the summed voltage difference squared and the selected number of ac current measurements used to generate the summed current squared are selected to begin at a zero crossing of the difference between the first and second ac voltage, and a closest zero crossing of the ac current.

10. - 20. (Cancelled)

21. (New)      A method of determining the impedance across a pressure junction in a section of an energized power distribution system using the energizing power, the method comprising:

measuring a first voltage produced by the energizing power at a first end of the section of the energized power system;

measuring a second voltage produced by the energizing power at a second end of the section of the energized power system;

measuring current through the section of the energized power system produced by the energizing power;

determining the impedance as a difference between first voltage and the second voltage divided by the current;

wherein the measuring of the first voltage, the second voltage and the current is performed repeatedly multiple times, and wherein determining the impedance of the section of the power distribution system comprises summing a difference between the first and second voltages to generate a summed voltage difference and summing the current to generate a summed current for a selected number of measurements of the first voltage, the second voltage and the current, and dividing the summed voltage difference by the summed current to generate the impedance;

wherein determining impedance comprises summing a squared difference between the first voltage and the second voltage to generate a summed voltage difference squared and summing the current squared to generate a summed current squared for the selected number of measurements of the first voltage, the second voltage and the current and dividing the summed voltage difference squared by the summed current squared to generate a representation of the impedance; and

wherein the energized power distribution system is an ac power distribution system in which the first voltage, the second voltage and the current are all ac and wherein determining the impedance comprises selecting measurements of the first ac voltage, the second ac

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voltage and measurements of the ac current used in generating the summed voltage difference squared and the summed current squared to eliminate any power factor in the energizing ac power.

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